"Prof. WRIGHT'S COAGULOMETER,"

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METHOD OF EMPLOYING COAGULATION TUBES.

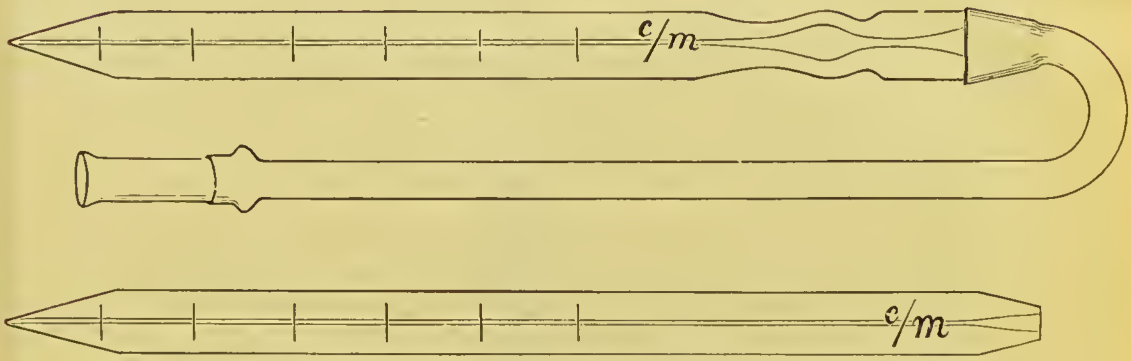

Fig. 1.—Ordinary Tube. Fig. 2.—Tube with Mixing Chamber.

These Tubes (figures 1 and 2) may be employed (*a*) for determining the condition of blood coagulability, or (*b*) for testing the effect on coagulability of the addition of various substances to the blood.

Principle of the Method.—The condition of blood coagulability is determined by aspirating blood into a series of tubes, and by blowing down tube after tube in succession until it is found that coagulation has taken place, and that the blood can no longer be blown out of the tube. Coagulation is then deemed to be complete. The interval which has elapsed is known as "coagulation time."

Conditions essential to Accuracy.—The following conditions must be observed: (1) any ligature which may be applied round the finger, from which blood is being withdrawn, must be relaxed at very frequent intervals (this precaution is designed to prevent stagnation of the blood and consequent alterations in coagulability); (2) a column of blood of approximately equal length (proposed standard length 5 c.m.) must be employed in each tube; (3) the capillary tubes which are employed must be of equal calibre (proposed standard diameter 0·25 m.m.); (4) the drop of blood must be aspirated into the tube with the least possible delay; (5) the column of blood must be aspirated some little distance up the tube (this precaution is designed to prevent any dessication of blood at the orifice of the tube); (6) the same constant temperature must be maintained during the course of an observation, or series of observations.

Working Instructions.—Blood is obtained in the usual manner, from a puncture made in the tip of the finger. Six to eight tubes are required for each coagulability determination. The tubes are to be employed after they have been brought to a temperature of 37° C. (blood-heat), or of 18·5° C. (half blood-heat), by means of the apparatus figured below.

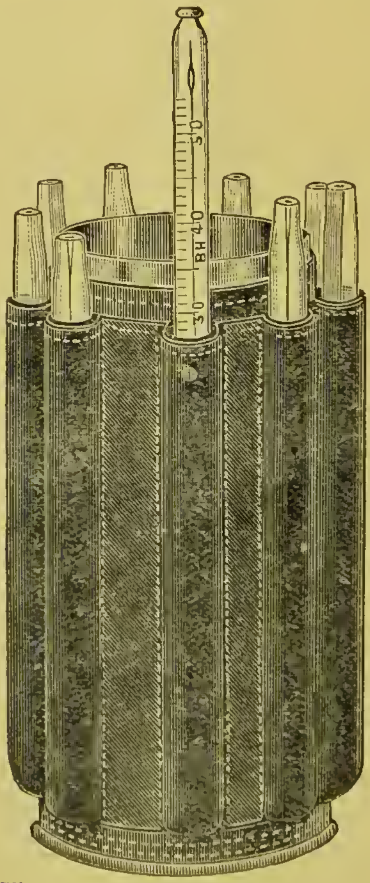

Fig. 3.—The Tubes arranged round the Water Tin.

The apparatus consists of a water tin surrounded by a leather jacket, lined with flannel and constructed in such a manner as to leave a series of pockets (of just sufficient size to admit a coagulation tube) between the layers of flannel. One of these pockets is reserved for a thermometer, which must be constructed out of glass tubing, which is comparable in thickness to that employed for the coagulation tubes. The remaining pockets are charged with coagulation tubes.

After the tubes have attained the desired *(a temperature of 18·5° Cent. (Circ. 65° Faht.) is suitable for ordinary cases. A temperature of 37° Cent. is preferable in cases where clotting occurs very slowly)* temperature, they are to be filled with blood up to the fifth division on the stem, and the contents are to be aspirated about another centimeter up the tube. The times (minutes and seconds) at which each tube is filled, are to be accurately noted down.

It is convenient to allow an interval of about half a minute to elapse between the filling of successive tubes.

In ordinary cases three minutes may be allowed to elapse before testing the condition of the blood in the first tube.

If the blood is found liquid on testing the first tube, a longer interval must be allowed before testing the second tube.

Contrariwise, if the blood is found clotted in the first tube, the next tube is to be tested at a somewhat shorter interval.

The first traces of clot can be detected by blowing out the contents of the tube on a piece of filter paper.

Method of employing the tubes to determine the inhibition or acceleration of coagulation, brought about by the addition of particular solutions to the blood—

Fill an aliquot part—say a sixth of the tube—with the fluid whose influence on coagulation it is desired to elicit. Into the tubes thus primed a column of blood of the usual length is introduced. Mixture of the fluid with the blood is effected by aspirating the contents of the tube into the mixing chamber, and then immediately blowing them down in an unbroken column into the stem of the pipette. The coagulation time obtained with the mixed blood is, of course, compared with that elicited for the unmixed blood. The coagulation inhibiting properties of decalcifying substances (such as soluble oxalates and citrates) or of additions of neutral salts, or of leech extract, can readily be demonstrated by this method.

Method of Cleaning Tubes.—The tubes can easily be cleaned by passing down a brass wire, and then washing them out with distilled water. The distilled water can then be removed from the tubes by drawing up a little absolute alcohol. In the same way the alcohol can be removed by ether. When the last traces of ether have volatalized, by blowing through a current of air, the tubes are ready for use.

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